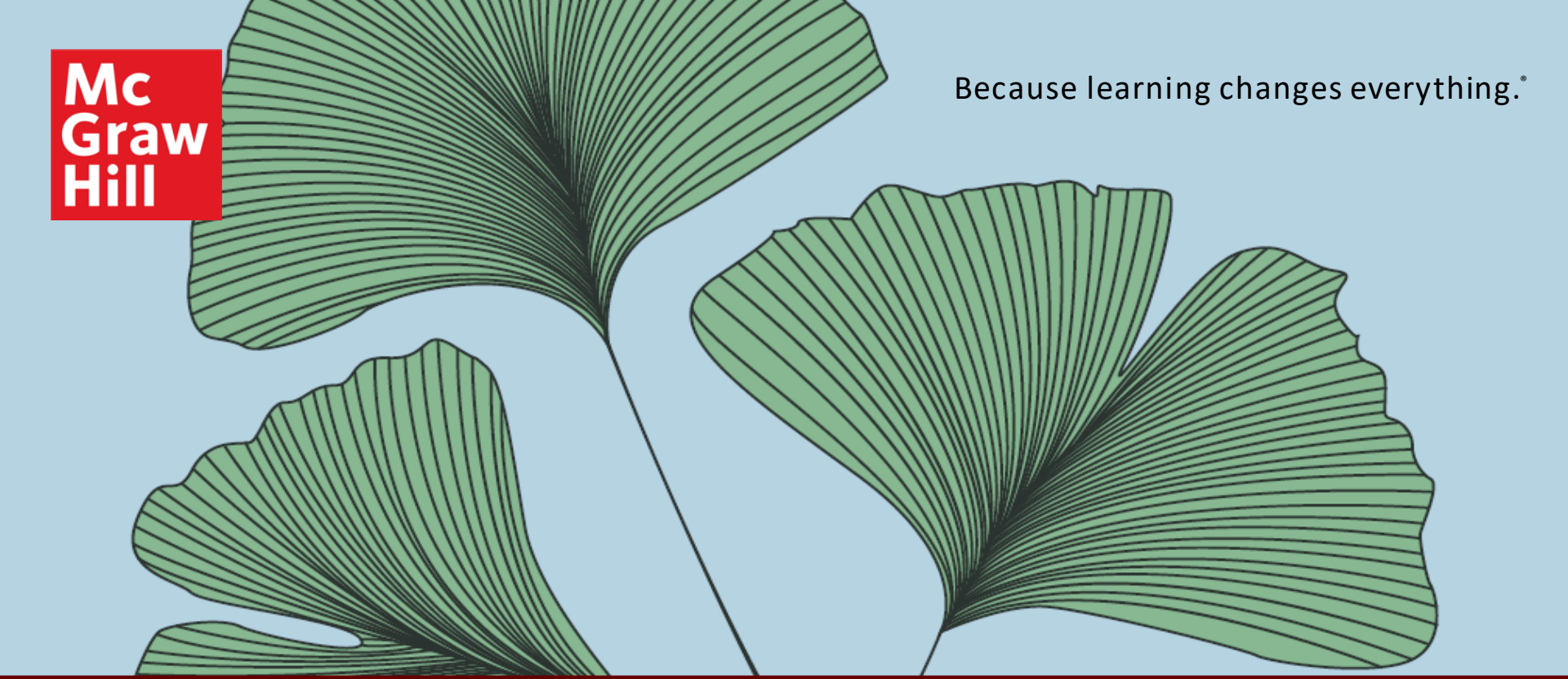

Chapter 2

Supply and Demand

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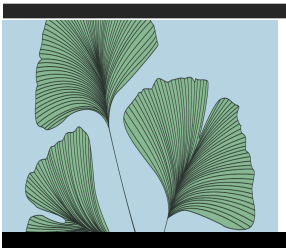

Learning Objectives

1. Describe how the demand and supply curves summarize the behavior of buyers and sellers in the marketplace.
2. Discuss how the supply and demand curves interact to determine equilibrium price and quantity.
3. Illustrate how shifts in supply and demand curves cause prices and quantities to change.
4. Explain why markets in equilibrium tend to leave no unexploited opportunities available to individuals.

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What, How, and for Whom?

- Every society answers three basic questions.

WHAT	• Which goods will be produced? • How much of each?
HOW	• Which technology? • Which resources are used?

FOR WHOM	• How are outputs distributed?
	  • Need?
	  • Income?

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Central Planning vs The Market

Central Planning

- **Decisions by individuals or small groups.**

Agrarian societies.

Government programs.

- Sets prices and goals for the group.

Individual influence is limited.

The Market

- **Buyers and sellers signal wants and costs.**

Resources and goods are allocated accordingly.

- Interaction of supply and demand answer the three basic questions.

Mixed economies use both the market and central planning

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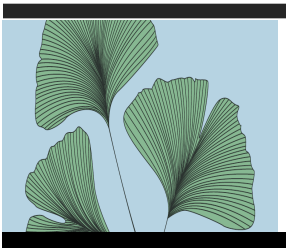

Buyers and Sellers in the Market

The **market** for any good consists of all the buyers and sellers of the good.

Buyers and sellers have different motivations.

- Buyers want to benefit from the good.
- Sellers want to make a profit.

Market price balances two forces.

- Value buyers derive from the good.
- Cost to produce the good.

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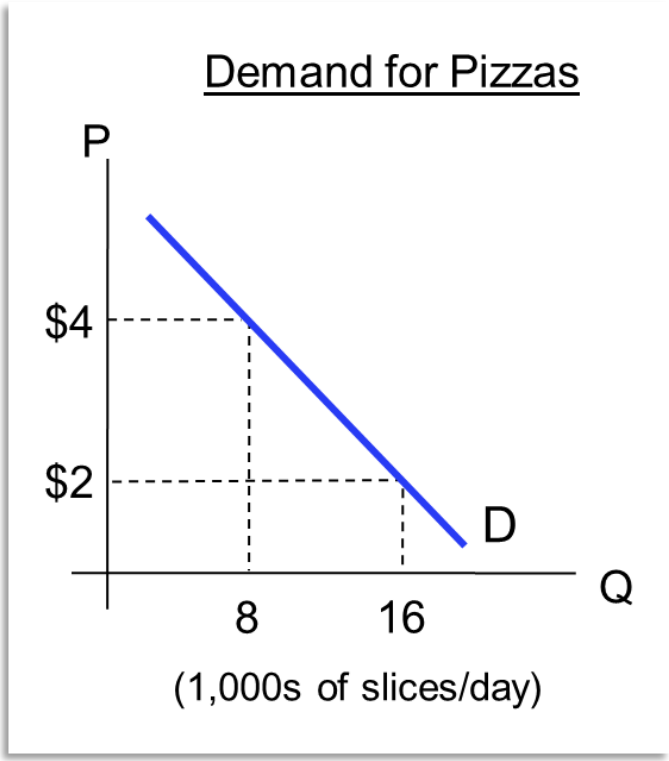
Demand

A **demand curve** illustrates the quantity buyers would purchase at each possible price.

Demand curves have a negative (downward) slope.

- Consumers buy less at higher prices.
- Consumers buy more at lower prices.



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Demand Slopes Downward

Buyers value goods differently.

- The **buyer's reservation price** is the highest price an individual is willing to pay for a good.

Demand reflects the entire market, not one consumer.

- Lower prices bring more buyers into the market.
- Lower prices cause existing buyers to buy more.

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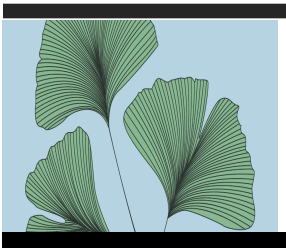

Income and Substitution Effects

Buyers buy more at lower prices and buy less at higher prices.

What happens when price goes up?

- The **substitution effect:** Buyers switch to substitutes when price goes up.
- The **income effect:** Buyers' overall purchasing power goes down.

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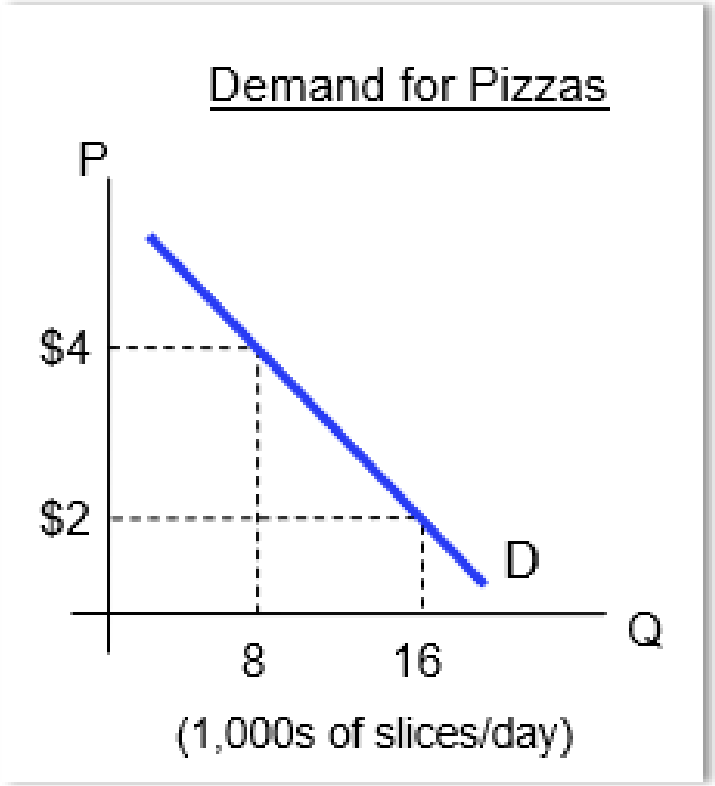
Interpreting the Demand Curve 1



- Horizontal interpretation of demand:

Given price, how much will buyers buy?

At a price of $4, the quantity demanded is 8,000 slices/day.

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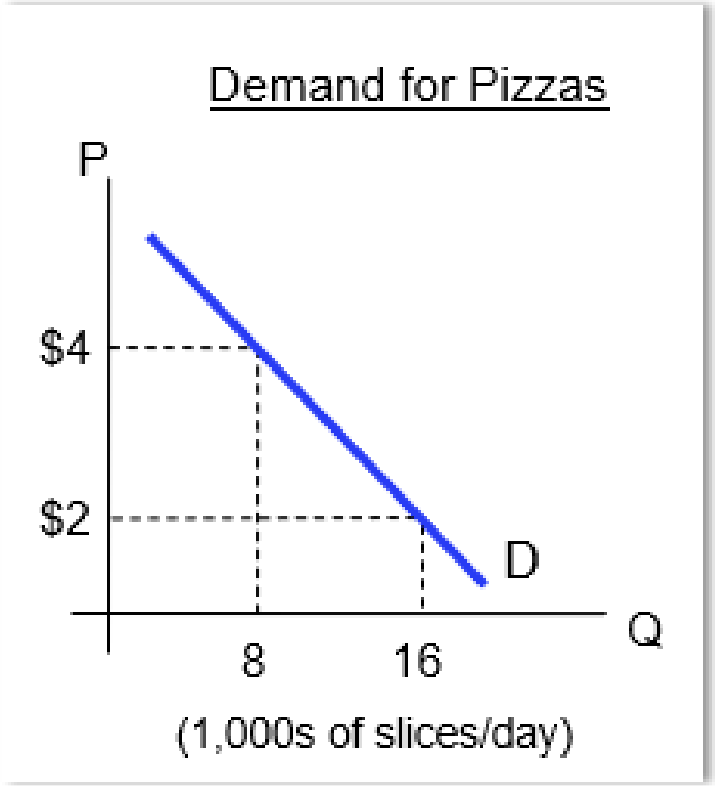
Interpreting the Demand Curve 2



- Vertical interpretation of demand:

Given the quantity to be sold, what price is the marginal consumer willing to pay?

The marginal consumer is willing to pay $4 per slice for the 8,000th slice sold in the market.

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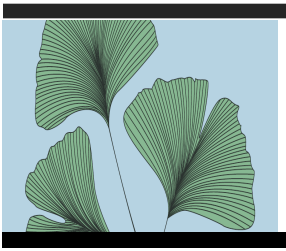

The Supply Curve

The **supply curve** illustrates the quantity of a good that sellers are willing to offer at each price.

- If the price is less than opportunity cost, offer more.

Opportunity cost differs among sellers due to:

- Technology.
- Skills.
- Different costs such as rent.
- Expectations.

The supply curve is upward sloping.

The **seller's reservation price** is the lowest price the seller would be willing to sell for.

- Equal to marginal cost.

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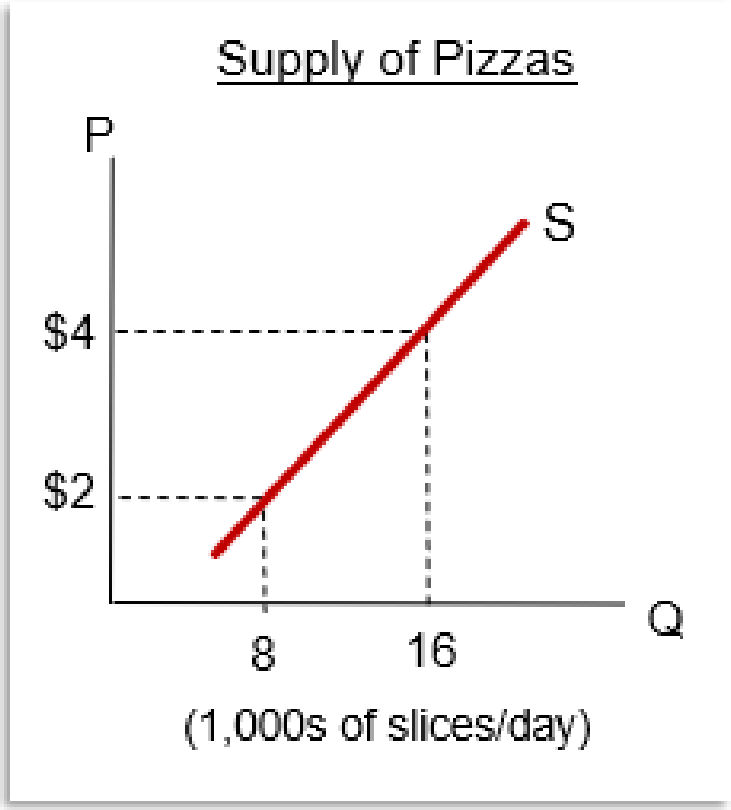
Interpreting the Supply Curve 1



- Horizontal interpretation of supply:

Given price, how much will suppliers offer?

At a price of $2, suppliers are willing to sell 8,000 slices/day.

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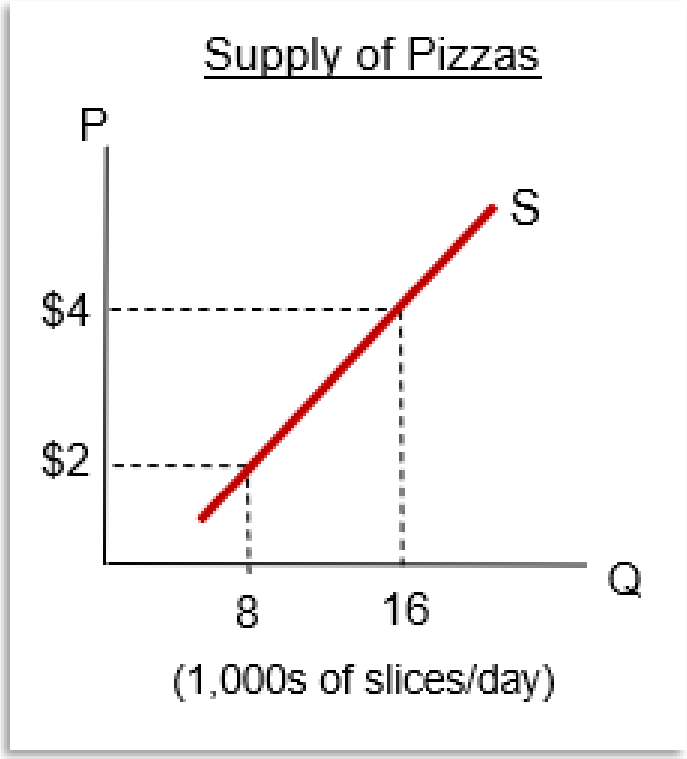
Interpreting the Supply Curve 2



- Vertical interpretation of supply:

Given the quantity to be sold, what is the opportunity cost of the marginal seller?

The marginal cost of producing the 8,000th slice is $2.

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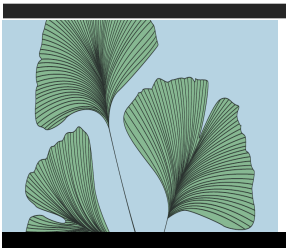

Market Equilibrium 1

A system is in **equilibrium** when there is no tendency for it to change.

The **equilibrium price** is the price at which the supply and demand curves intersect.

The **equilibrium quantity** is the quantity at which the supply and demand curves intersect.

The **market equilibrium** occurs when all buyers and sellers are satisfied with their respective quantities at the market price.

- At the equilibrium price, quantity supplied equals quantity demanded.

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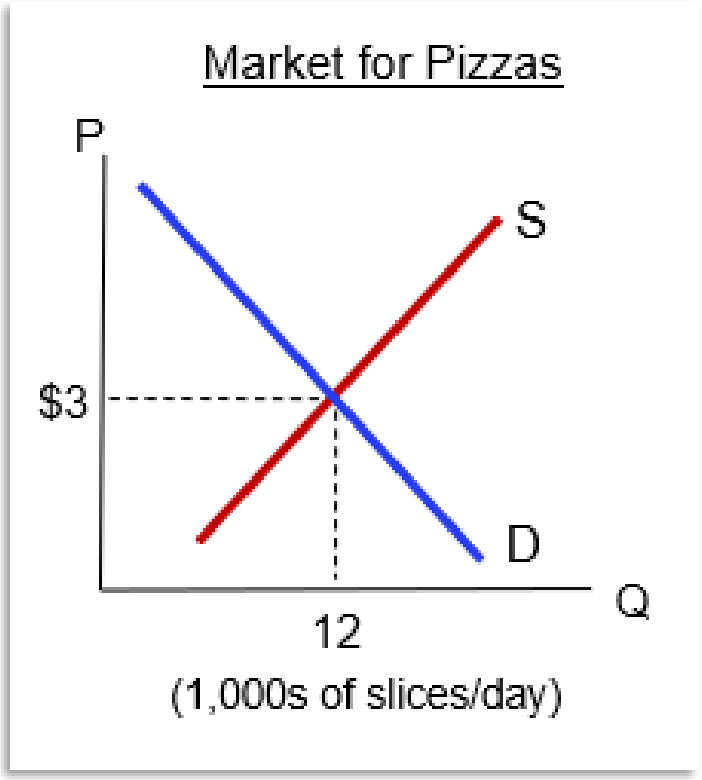
Market Equilibrium 2

- Quantity supplied equals quantity demanded AND.
- Price is on supply and demand curves .
- No tendency to change *P* or *Q*.

Buyers are on their demand curve.

Sellers are on their supply curve.



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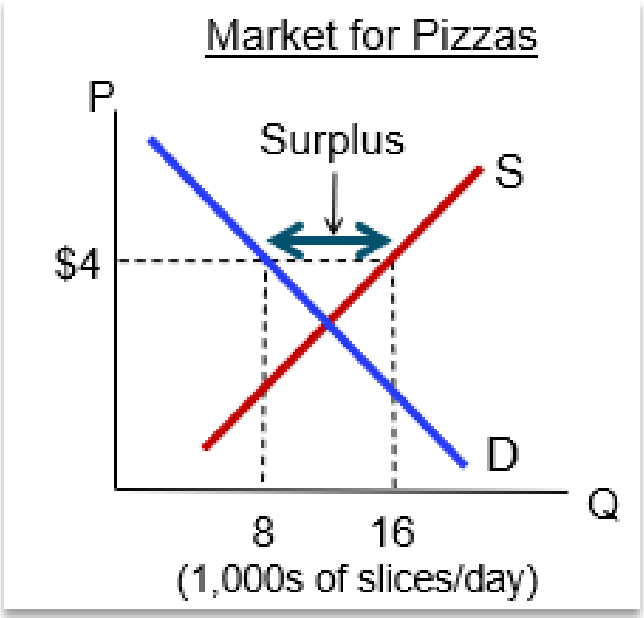
Excess Supply and Excess Demand

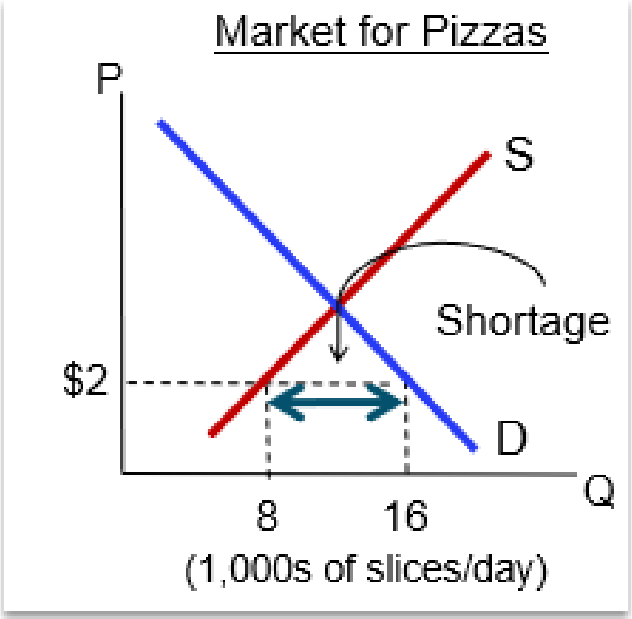
Excess Supply

- At $4, 16,000 slices supplied and 8,000 slices demanded.



Excess Demand

- At $2, 8,000 slices supplied and 16,000 slices demanded.



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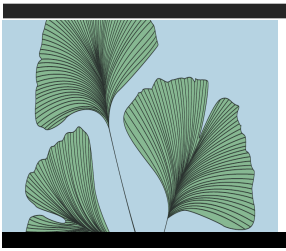

Incentive Principle: Excess Supply

Each supplier has an incentive to decrease the price in order to sell more.

Lower prices decrease the surplus.

As price decreases:

- the quantity offered for sale decreases along the supply curve.
- the quantity demanded increases along the demand curve.

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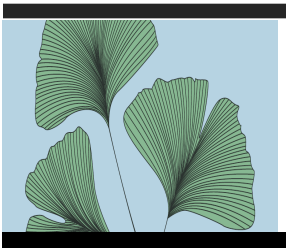

Incentive Principle: Excess Demand

Each supplier has an incentive to increase the price in order to sell more.

Higher prices decrease the shortage.

As price increases.

- the quantity offered for sale increases along the supply curve.
- As price increases, the quantity demanded decreases along the demand curve.

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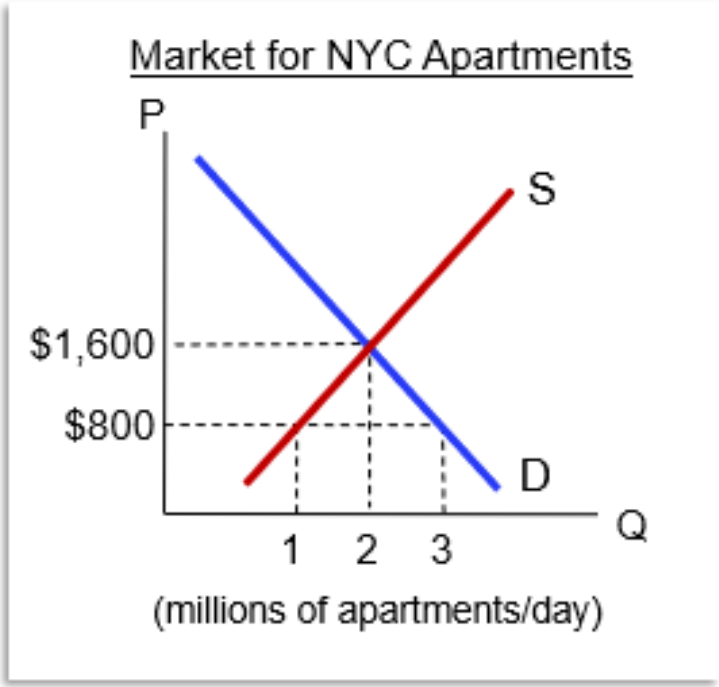
Rent Controls Are Price Ceilings

- A **price ceiling** is a maximum allowable price, set by law.
- Rent controls set a maximum price that can be charged for a given apartment.
- If the controlled price is below equilibrium, then:

Quantity demanded increases.

Quantity supplied decreases.

A shortage results.



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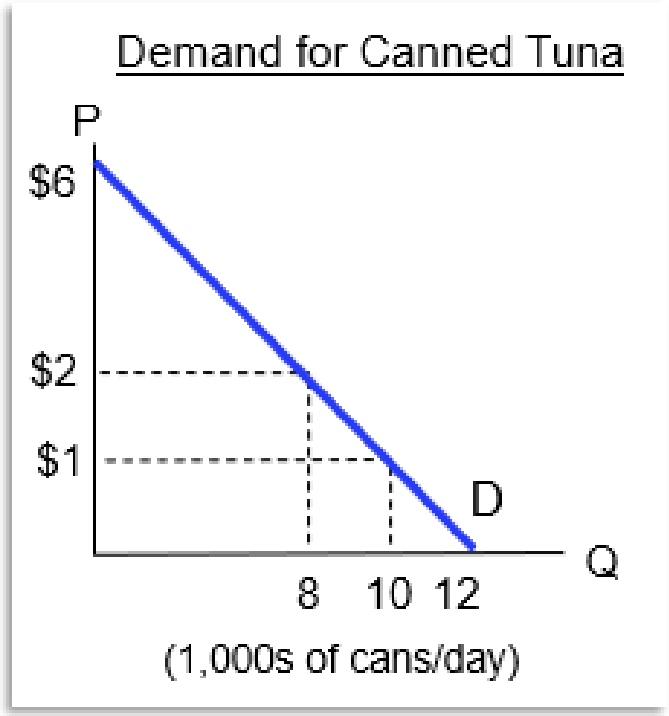
Movement along the Demand Curve

- When price goes up, quantity demanded goes down.
- When price goes down, buyers move to a new, higher quantity demanded.
- A **change in quantity demanded** results from a change in the price of a good.



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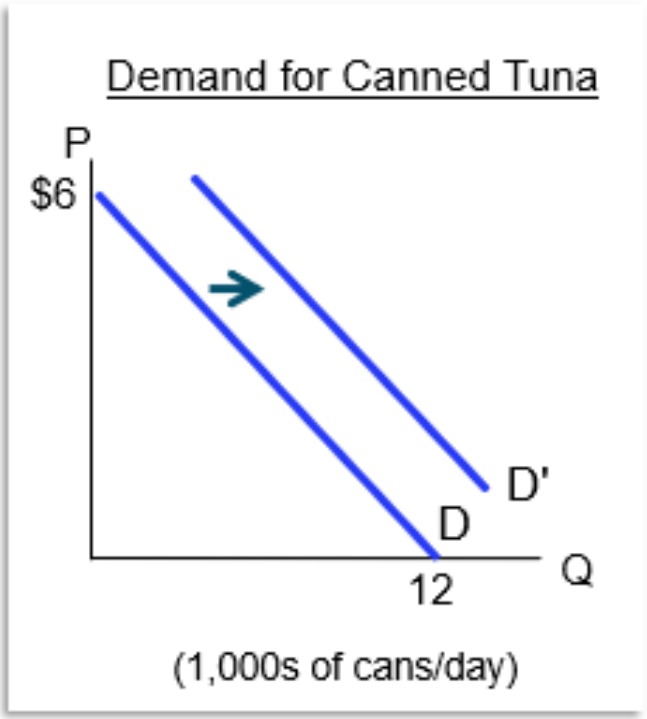
Shift in Demand

- If buyers are willing to buy more **at each price**, then demand has increased.

Move the entire demand curve to the right.

Change in demand.

- If buyers are willing to buy less at each price, then demand has decreased.



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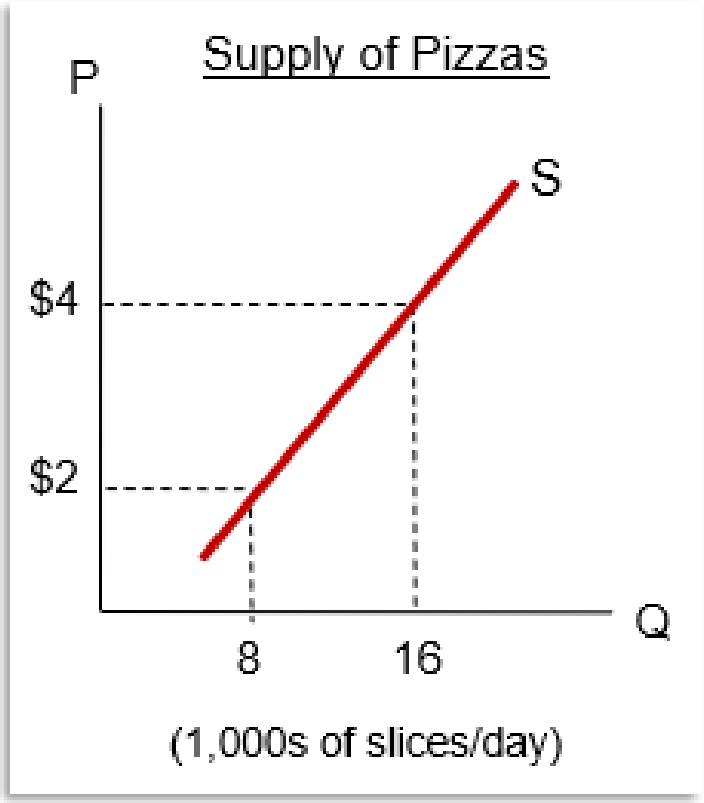
Movement Along the Supply Curve

- When price goes up, quantity supplied goes up.
- When price goes up, sellers move to a new, higher quantity supplied.
- A **change in quantity supplied** results from a change in the price of a good.



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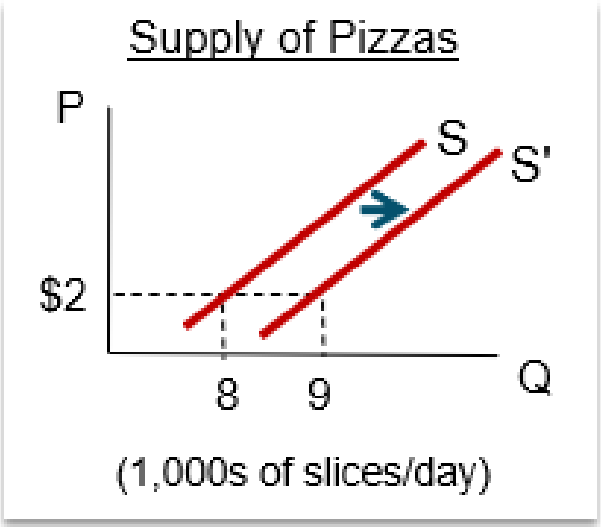
Shift in Supply

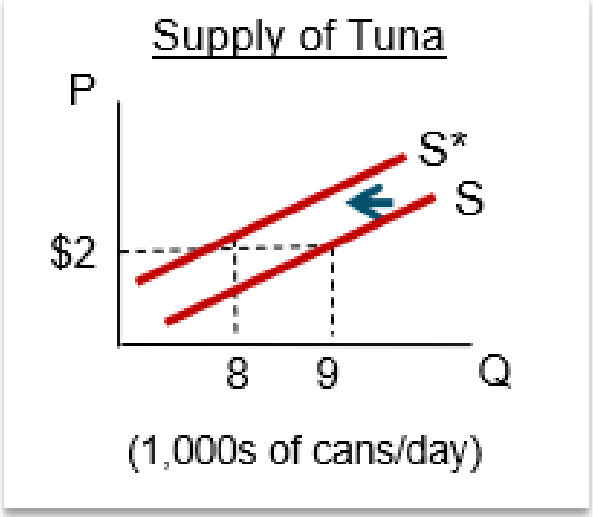
Supply increases when sellers are willing to offer more for sale **at each possible price.**

Moves the entire supply curve to the right.

Supply decreases when sellers are willing to offer less for sale **at each possible price.**

Moves the entire supply curve to the left .





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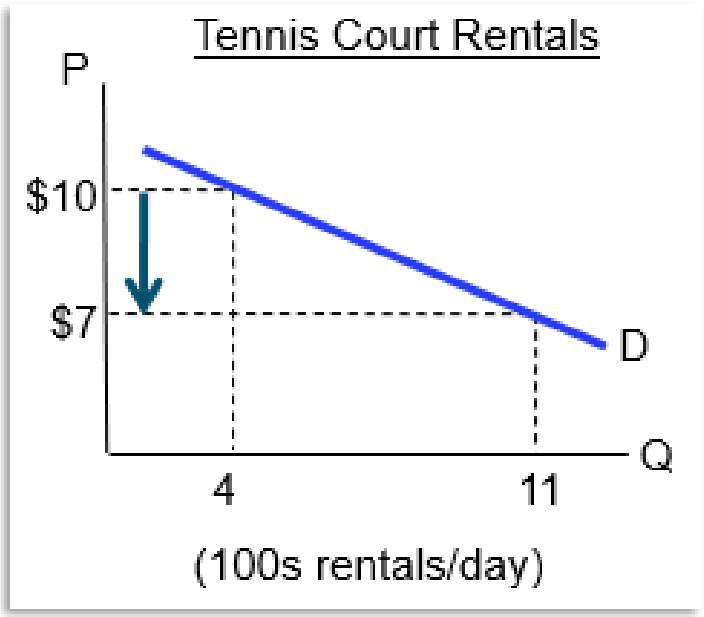
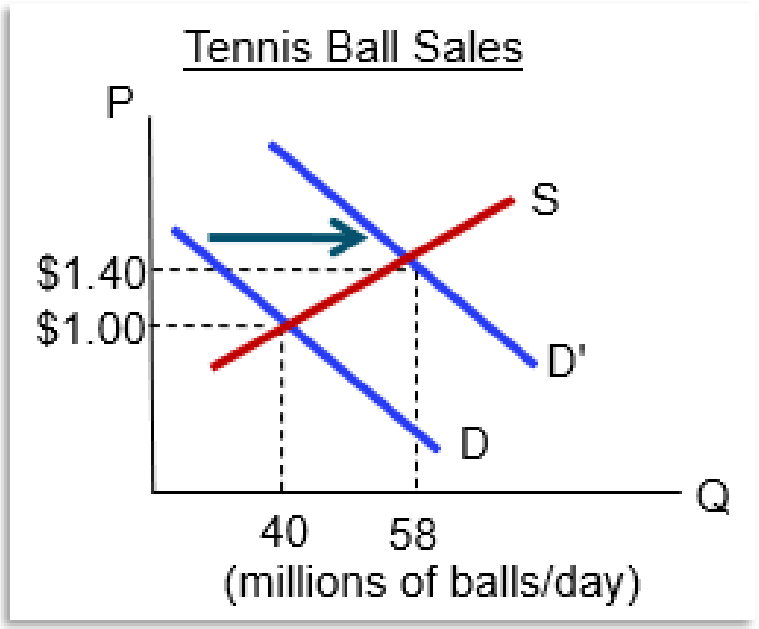
Tennis Market

If the price of renting for tennis court decreases, demand for tennis balls increases.

- Tennis courts and tennis balls are **complements.**





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Causes of Shifts in Demand

Price of complementary goods.

- Tennis courts and tennis balls.

Price of substitute goods.

- E-mail and snail mail are **substitutes.**

Income: normal or inferior goods?

Preferences.

- Marvel action figures after release of Marvel Studio film.

Number of buyers in the market.

Expectations about the future.

Price changes never cause a shift in demand.

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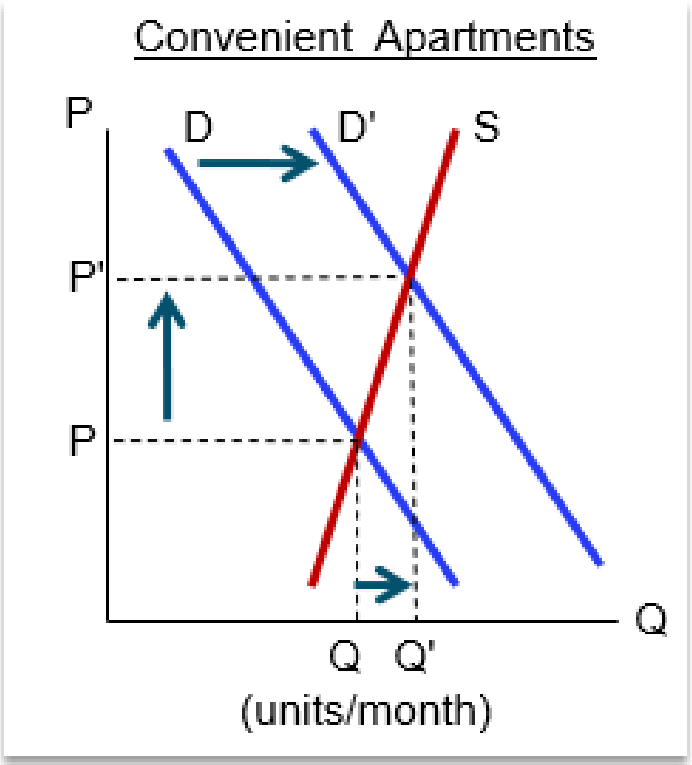
Apartments Near DC Metro



- If government wages rise, demand for apartments near Metro stations increases.

Demand increases.

Price increases.

Quantity increases.

- Demand for a **normal good** increases when income increases.

Demand for an **inferior good** increases when income decreases.

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Causes of Shifts in Supply

A change in the price of an input.

- Fiberglass for skateboards, construction wages.

A change in technology.

- Word-processing technology and term papers.
- Internet distribution of products (e-commerce).

Weather (agricultural commodities and outdoor entertainment).

Number of sellers in the market.

Expectation of future price changes.

Price changes never cause a shift in supply.

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Shift in Supply: Skateboards

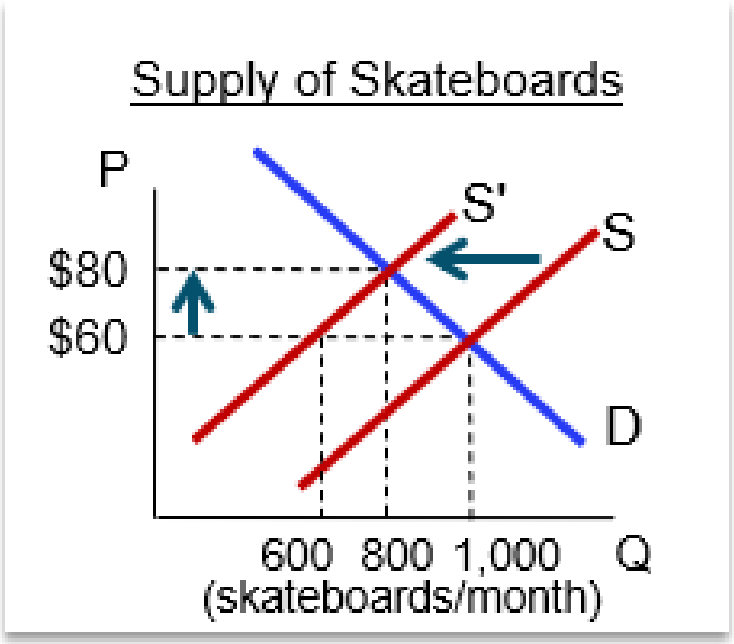
Costs of production affect the supply of a product.

Cost of fiberglass for skateboards increases.

- Supply decreases.

With no change in demand, the price of skateboards increases to $80 and quantity decreases to 800.

Remember – **don't** think "price went up so demand should shift left." Price changes **never** cause a shift in demand.



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Shift in Supply: Home Construction

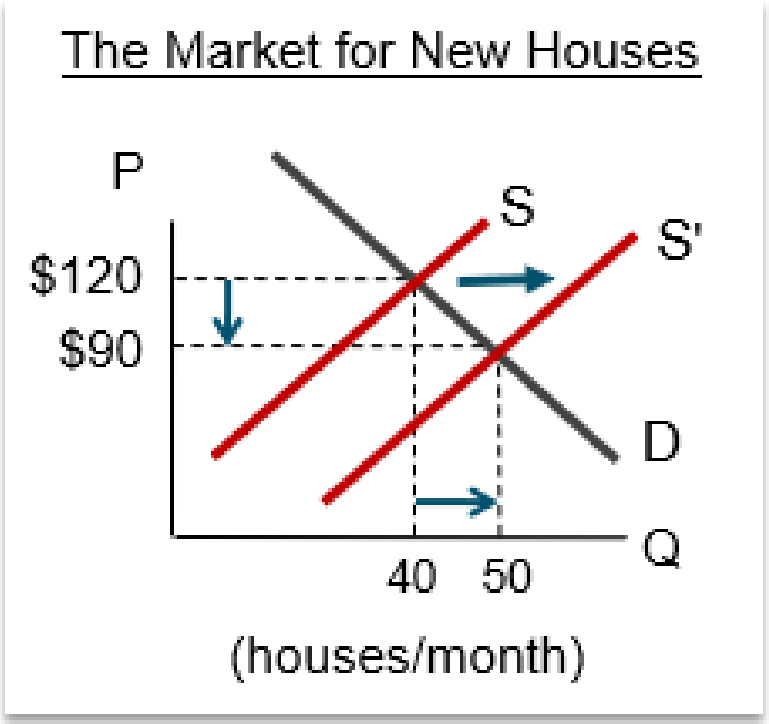
Cost of labor used to produce houses decreases.

- Supply increases.

Demand is constant.

The price of houses decreases to $90,000 per house.

Quantity increases to 50.



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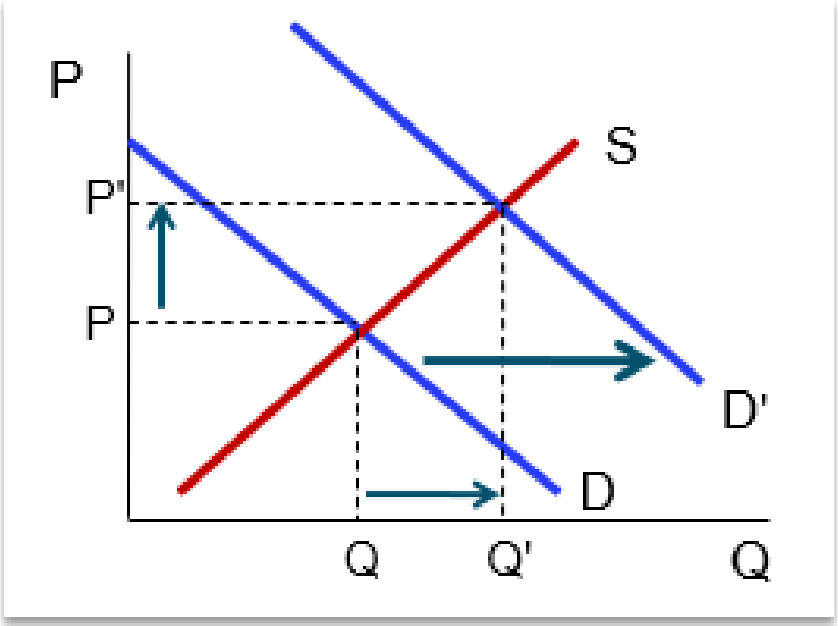
Supply and Demand Shifts: Four Rules 1

Rule 1:

An increase in demand will lead to an increase in both equilibrium price and quantity.



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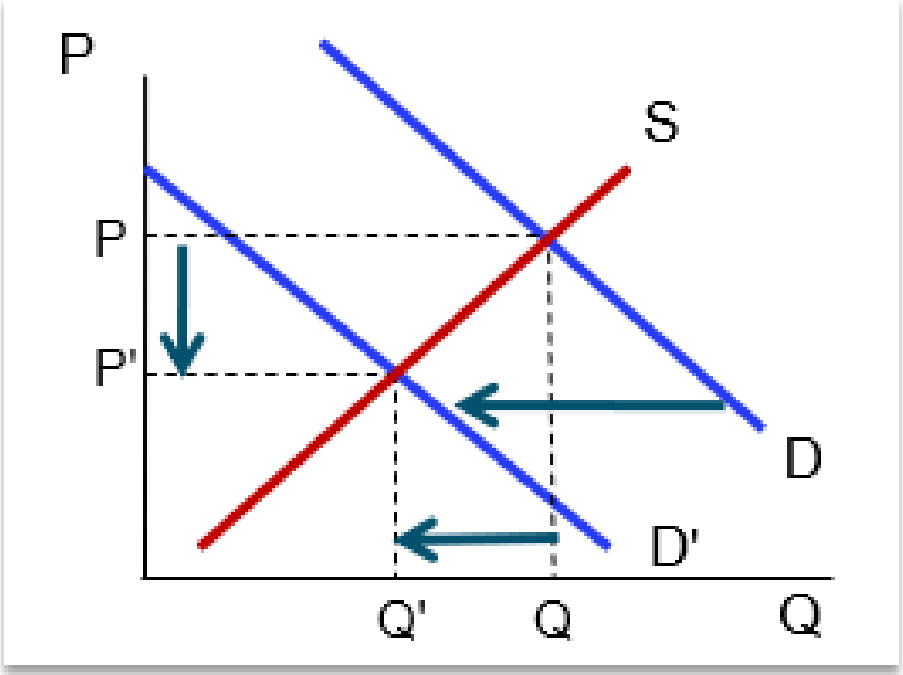
Supply and Demand Shifts: Four Rules 2

Rule 2:

A decrease in demand will lead to a decrease in both equilibrium price and quantity.



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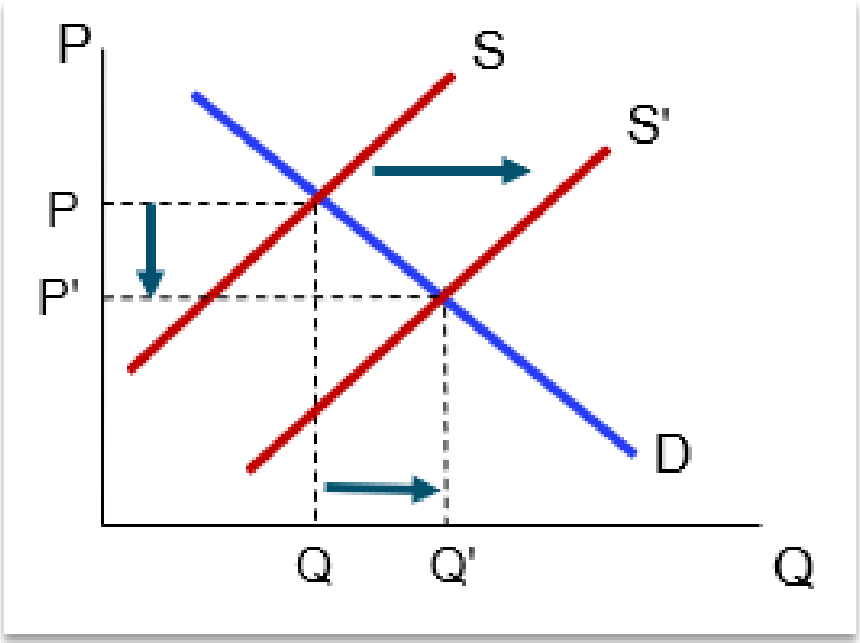
Supply and Demand Shifts: Four Rules 3

Rule 3:

An increase in supply will lead to a decrease in the equilibrium price and an increase in the equilibrium quantity.



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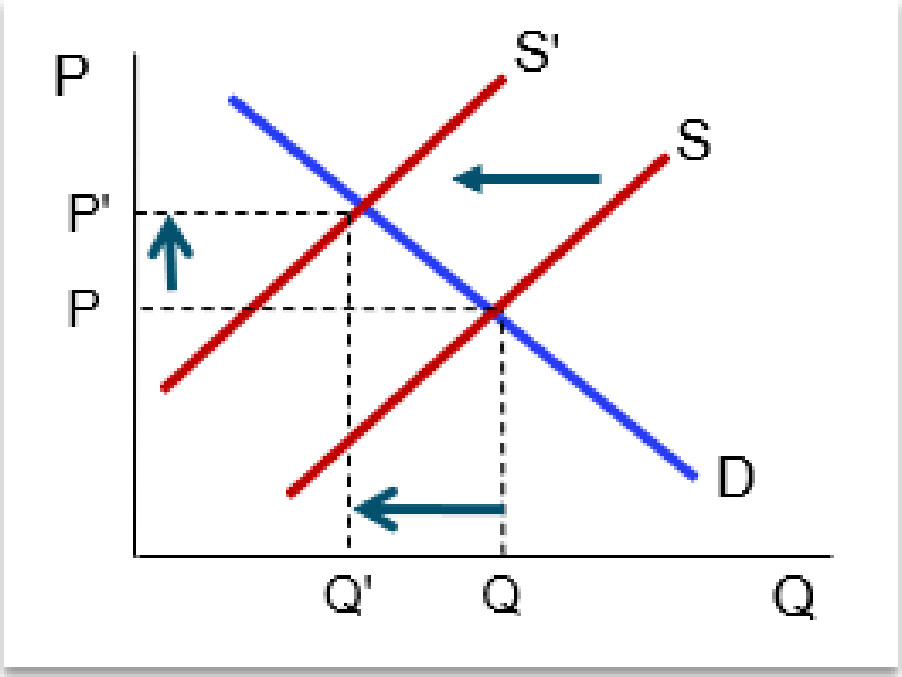
Supply and Demand Shifts: Four Rules 4

Rule 4:

A decrease in supply will lead to an increase in the equilibrium price and a decrease in the equilibrium quantity.



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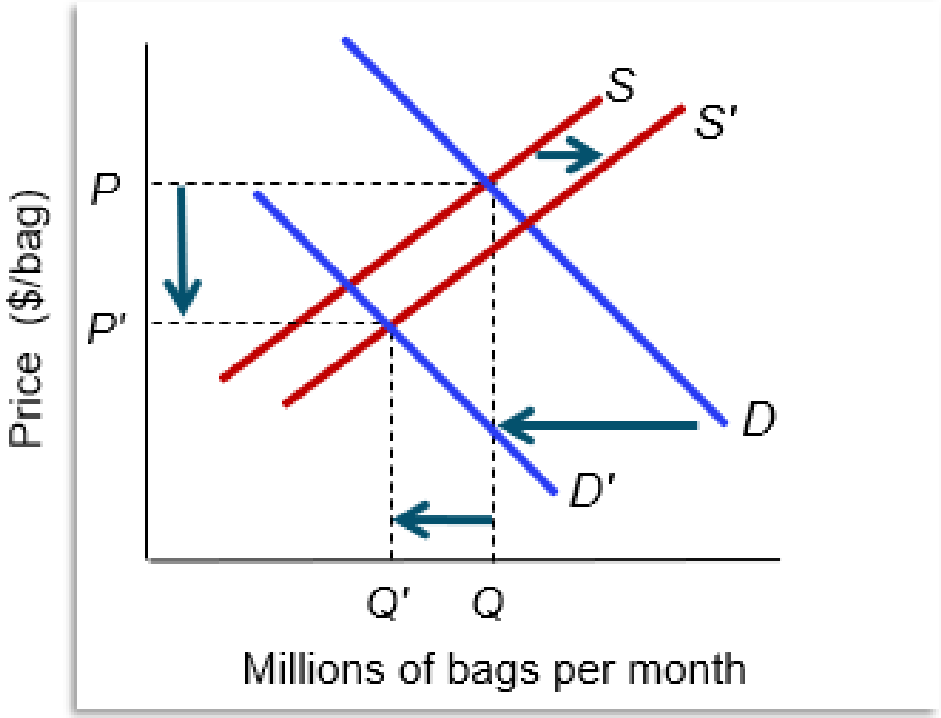
Supply and Demand Both Change: Tortilla Chips

Oils used for frying are discovered to be harmful AND the price of corn harvesting equipment decreases.



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Changes in Supply and Demand

	Supply	
Demand	**Increases**	**Decreases**
Increases	P Depends Q Increases	P Increases Q Depends
Decreases	P Decreases Q Depends	P Depends Q Decreases

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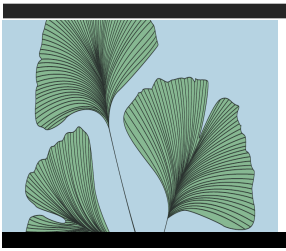

Efficiency and Equilibrium

Markets communicate information effectively.

- Value buyers place on the product.
- Opportunity cost of producing the product.

Markets maximize the difference between benefits and costs (economic surplus).

Market outcomes are the best provided that.

- The market is in equilibrium AND.
- No costs or benefits are shared with the public.

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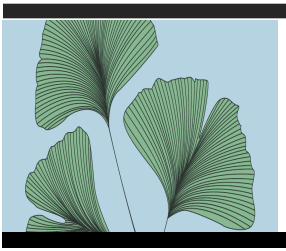

Cash on the Table

Buyer's surplus: buyer's reservation price minus the market price.

Seller's surplus: market price minus the seller's reservation price.

Total surplus = buyer's surplus + seller's surplus.

Total surplus is buyer's reservation price – seller's reservation price.

No cash on the table when surplus is maximized.

- No opportunity to gain from additional sales or purchases.

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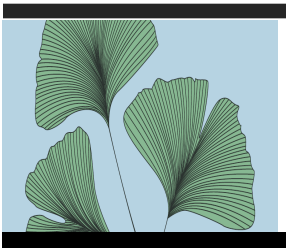

Efficiency Principle

The **socially optimal quantity** maximizes total surplus for the economy from producing and selling a good.

Economic efficiency – all goods are produced at their socially optimal level.

Market equilibrium quantity of a good will equal the marginal cost and marginal benefit, if.

- Sellers pay all the costs of production.
- Buyers receive all the benefits of their purchase.

Efficiency: marginal cost equals marginal benefit.

- Production is efficient if total surplus is maximized.

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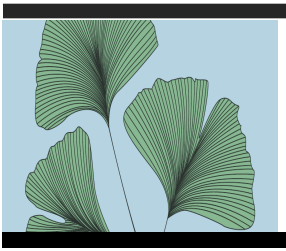

Smart for One, Dumb for All

Producers sometimes shift costs to others.

- Pollution is like getting free waste disposal services.
- Total marginal cost = seller's marginal cost + marginal cost of pollution.
- When costs are shifted, supply is greater than socially optimal.

Buyers may create benefits for others.

- Marginal benefit is less than the full social benefit.
- Vaccinations, my neighbor's landscaping.
- The demand for these goods is less than socially optimal.

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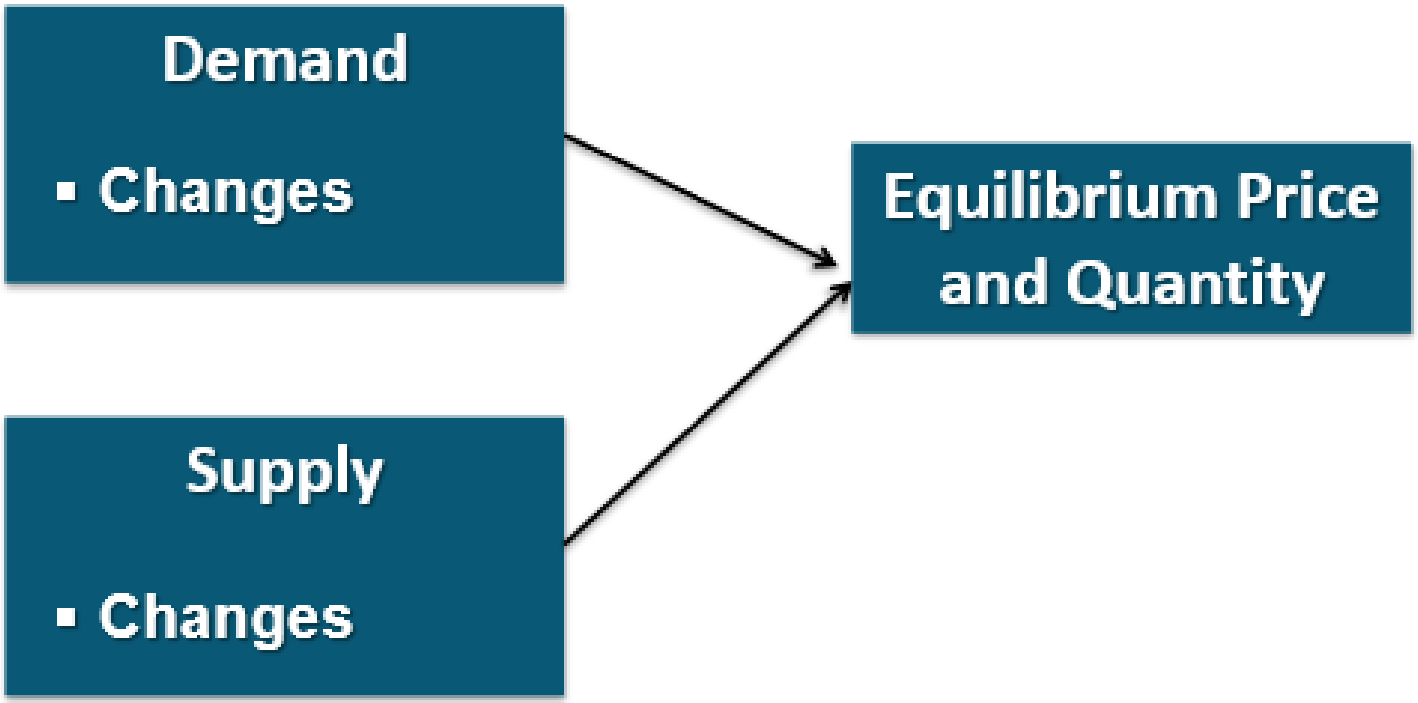
Supply and Demand



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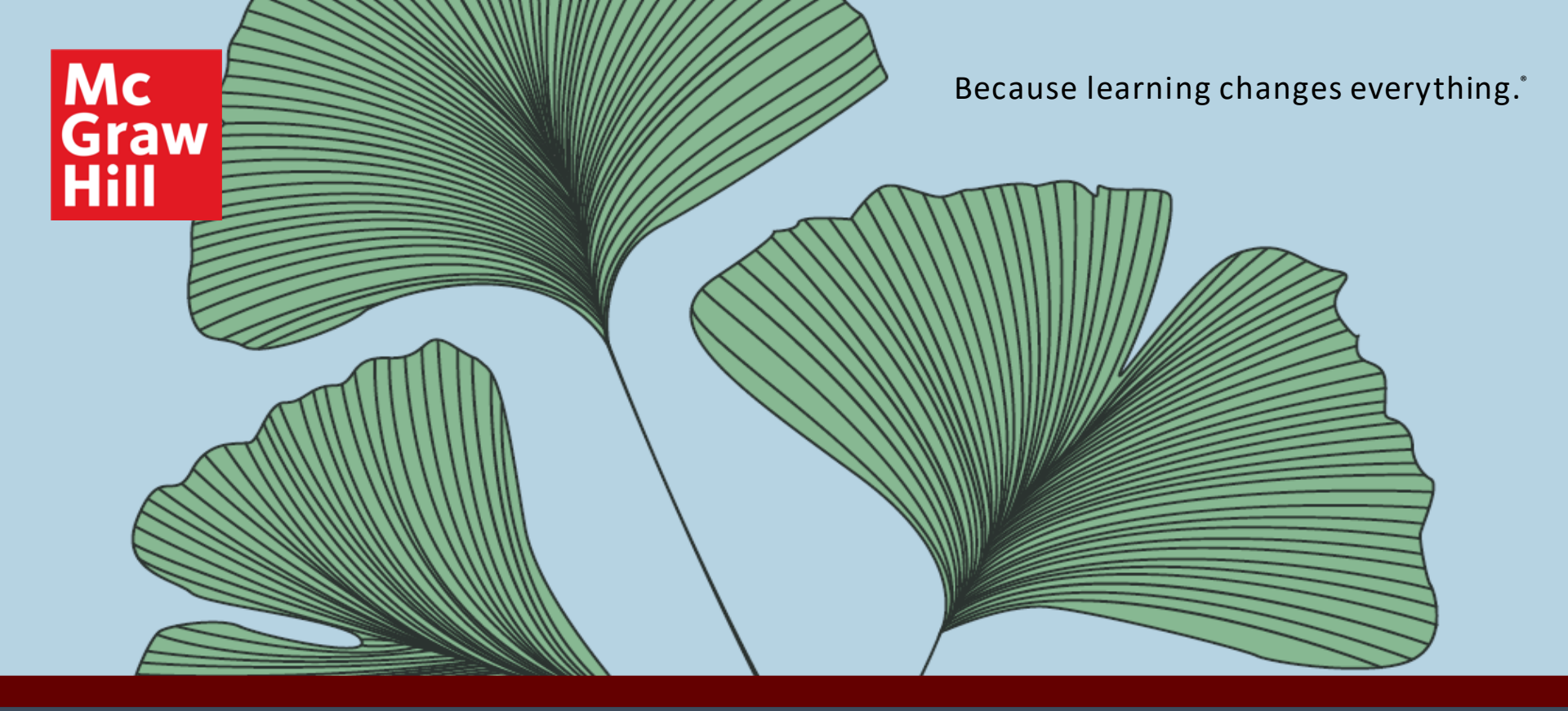

Chapter 2 Appendix

The Algebra of Supply and Demand

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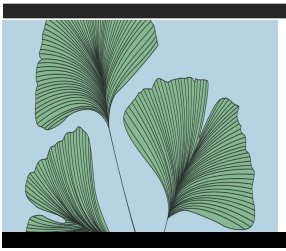

From Graphs to Equations …

- Sample equations.

$$P = 16 - 2Q^d$$

is a straight-line demand curve with intercept 16 on the vertical (P) axis and a slope of − 2.

$$P = 4 + 4Q^s$$

is a straight-line supply curve with intercept 4 and a slope of 4.

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… To Equilibrium P and Q

Equilibrium is where P and Q are the same for demand and supply.

- Set the two equations equal to each other ($P = P$) and solve for $Q(Q^s = Q^d = Q^*)$.

$$16 - 2Q^* = 4 + 4Q^*$$

$$6Q^* = 12$$

$$\boldsymbol{Q^* = 2}$$

Use either the supply or demand curve and $Q^* = 2$ to find price.

$$P = 16 - 2\,Q^*$$

$$P = 16 - 2\,(2)$$

$$\boldsymbol{P = \$12}$$

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